

Rpt. 13.

No. 57651

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

11 NOV 1936

Received at London Office

Date of writing Report 29-10-1936 When handed in at Local Office 9-11-1936 Port of Glasgow.

No. in Survey held at Greenock. Date, First Survey 2-9-36 Last Survey 3-11-1936
 Reg. Book. 73221 on the T.S.S. "CLAN MACAULAY." (Number of Visits.....10.....)

Built at Greenock By whom built The Greenock Dockyard Co Ltd No. 425 When built 1936

Owners The Clan Line Steamers Ltd. Port belonging to Glasgow.

Electric Light Installation fitted by Campbell & Isherwood Ltd Contract No. 425 When fitted 1936

Is the Vessel fitted for carrying Petroleum in bulk no.

Tons { Gross 10492
 Net 6118

System of Distribution Two wire

Pressure of supply for Lighting 220. volts, Heating - volts, Power 220 volts.

Direct or Alternating Current, Lighting Direct Power Direct

If alternating current system, state frequency of periods per second -

Has the Automatic Governor been tested and found efficient when the whole load is suddenly thrown on or off Yes

Generators, do they comply with the requirements regarding temperature rise Yes, are they compound wound Yes

are they over compounded 5 per cent. Yes, if not compound wound state distance between each generator -

Where more than one generator is fitted are they arranged to run in parallel no., is an adjustable regulating resistance fitted in series with each shunt field Yes

Have certificates of test results for machines under 100 kw. been submitted and approved Yes Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing no. (see London letter 6/11/36)

Are all terminals accessible, clearly marked, and furnished with sockets Yes, are they so spaced or shielded that they cannot be accidentally earthed, short circuited, or touched Yes

Are the lubricating arrangements of the generators as per Rule Yes

Position of Generators On special platform in Engine Room., is the ventilation in way of the generators satisfactory Yes are they clear of all inflammable material Yes if situated near unprotected

woodwork or other combustible material, state distance of same horizontally from or vertically above the generators - and -

are the generators protected from mechanical injury and damage from water, steam or oil Yes, are their axes of rotation fore and aft Yes

Earthing, are the bedplates and frames of the generating plant efficiently earthed Yes are the prime movers and their respective generators in metallic contact Yes

Main Switch Boards, where placed In Engine Room near generator.

If the generators and main switchboard are not placed in the same compartment, is each generator provided with a fuse on each insulated pole as near as possible to the terminals of the generator, additional to that provided on the main switchboard -

Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes Yes, are they protected from mechanical injury and damage from water, steam or oil Yes, if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards - and -, are they constructed wholly of durable, non-ignitable non-absorbent materials Yes, is all insulation of high dielectric strength and of permanently high insulation resistance Yes, is it of an approved type Yes, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework Indonite., is the non-hygroscopic insulating material of an approved type Yes, and is the frame effectively earthed Yes Are the fittings as per Rule regarding:— spacing or shielding of live parts Yes, accessibility of all parts Yes, absence of fuses on back of board Yes, temperature rise of omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position no are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches no.

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches

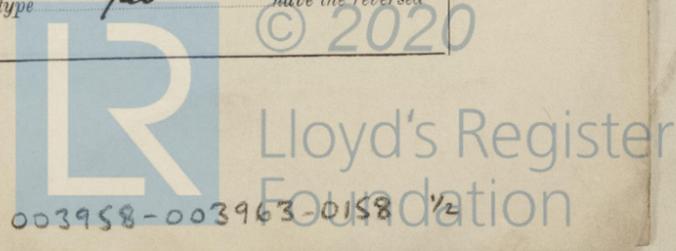
D.P. 1/2 circuit breakers for 100kW. & 60kW. Generators. D.P. switch fuses for 30kW generator. D.P. 1/2 switch fuses for each outgoing circuit.

Are turbine driven generators fitted with emergency trip switch as per rule - Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material - Instruments on main switchboard 5 ammeters 4

voltmeters - synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection -

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system Earth Lamps

Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules Yes are the fusible cutouts of an approved type Yes have the reversed



current protection devices been tested under working conditions —

construction, protection, insulation, material, and position of these as per rule **Yes**

Cables: Single, twin, concentric, or multicore **Single Twin** are the cables insulated and protected as per Tables IV, V, X or XI of the Rules **Yes**

If the cables are insulated otherwise than as per Rule, are they of an approved type — **6 volts**

area of 0.04 square inch and above provided with soldering sockets **Yes**

If conductors are paper or varnished cambric insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound —, or waterproof insulating tape —

not exposed to drip or accumulation of water or oil, or to high temperature from boilers, steam pipes, uptakes or other hot objects, or to avoidable risk of mechanical damage **Yes** Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit **Yes**

Support and Protection of Cables, state how the cables are supported and protected **Main on deck. V.I.R. or H.R. braced in galv. tubing. Machinery spaces. L.C.B. clipped to steel truss. Accommodation H.R. or L.C.B. clipped.**

If cables are run in wood casings, are the casings and caps secured by screws —, are the cap screws of brass —, are the cables run in separate grooves — If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII **Yes**

Refrigerated Chambers, are the cables and fittings in accordance with the special requirements **Yes**

Joints in Cables, state if any, and how made, insulated, and protected **None**

Watertight Glands and Deck Tubes, are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands **Yes**

Bushes in Beams and Non-watertight Partitions, where unarmoured cables pass through beams and non-watertight partitions, are the holes efficiently bushed **Yes** state the material of which the bushes are made **Lead**

Earthing Connections, state what earthing connections are fitted and their respective sectional areas **Metallic sheathing of cables**

are their connections made as per Rule —

Alternative Lighting, are the groups of lights in the propelling machinery space arranged as per Rule **Yes** **Emergency Supply,** state position and method of control of the emergency supply and how the generator is driven —

Navigation Lamps, are these separately wired **Yes**, controlled by separate switch and separate fuses **Yes**, are the fuses double pole **Yes** are the switches and fuses grouped in a position accessible only to the officers on watch **Yes** has each navigation lamp an automatic indicator as per Rule **Yes** **Secondary Batteries,** are they constructed and fitted as per Rule —

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, watertight **Yes** are any fittings placed in spaces in which goods are liable to be stacked in close proximity to them; if so, how are they protected —

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected —

how are the cables led —

where are the controlling switches situated —

are all fittings suitably ventilated **Yes**, are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials **Yes**

Heating and Cooking Appliances, are they constructed and fitted as per Rule —, are air heaters constructed and fitted as per Rule —

Searchlight Lamps, No. of —, whether fixed or portable —, are their fittings as per Rule —

Arc Lamps, other than searchlight lamps, No. of —, are their live parts insulated from the frame or case —, are their fittings as per Rule —

Motors, are their working parts readily accessible **Yes**, are the coils self-contained and readily removable for replacement **Yes** are the brushes, brush holders, terminals and lubricating arrangements as per Rule **Yes**, are the motors placed in well-ventilated compartments in which inflammable gases cannot accumulate and clear of all inflammable material **Yes** are they protected from mechanical injury and damage from water, steam or oil **Yes** are their axes of rotation fore and aft **Yes or Vertical** if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or flame proof type **Yes** if not of this type, state distance of the combustible material horizontally or vertically above the motors — and —

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing — **Control Gear and Resistances,** are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule **Yes** **Lightning Conductors,** where lightning conductors are required, are these fitted as per Rule — **Ships carrying Oil having a Flash Point less than 150° F.** Have the special requirements of the Rules been complied with regarding switches, joint boxes, section and distribution boards, protection of cables, method of distribution, lead of cables, lights and fittings — are all fuses of the filled cartridge type — are they of an approved type —

If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed type approved by the Home Office —

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule **Yes**

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN	2	100	220	455	550	Steam Engines		
AUXILIARY	1	60	220	273	550	do		
EMERGENCY	1	30	220	136	500	do (See Birmingham Carb. C. 13)		
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
MAIN GENERATOR	2	160	37	.103	455	450	84	Rubber.	L. C. B.
EQUALISER CONNECTIONS									
AUXILIARY GENERATOR	2	30	37	.072	273	304	70	"	"
EMERGENCY GENERATOR	1	15	37	.072	136	152	50	"	"
ROTARY TRANSFORMER MOTOR GENERATOR									
ENGINE ROOM	1	.007	7	.036	16	24	50	"	"
BOILER ROOM	1	.003	3	.036	7	12	180	"	"
AUXILIARY SWITCHBOARDS									
REFRIG. ENG. ROOM D.B.	1	.003	3	.036	7	12	120	"	"
FOOD D.B.	1	.0045	7	.029	7	18.2	434	"	H.R. Braced in Tubing
LOWER POOP D.B.	1	.0045	7	.029	4	18.2	110	"	L. C. B.
AFT CARGO D.B.	1	.003	3	.036	6	12.0	320	"	H.R. Braced in Tubing
MID. CARGO D.B.	1	.007	7	.036	12	24	440	"	"
ACCOMMODATION									
FORWARD CARGO D.B.	1	.007	7	.036	8	24	320	"	"
NAVIGATION D.B.	1	.0045	7	.029	10	18.2	94	"	"
SALOON HOUSE D.B.	1	.007	7	.036	15	24	440	"	"
OFFICERS' HOUSE D.B.	1	.007	7	.036	7	24	50	"	"
WIRELESS	1	.007	7	.036	15	24	132	"	"
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	18	7.8	380	"	"
SIDE LIGHTS	1	.002	3	.029	18	7.8	160	"	L. C. B.
COMPASS LIGHTS	1	.002	3	.029	10	7.8	60	"	"
FORWARD SIDE HOUSES	1	.007	7	.036	13	24	140	"	"
POOP HOUSES	1	.007	7	.036	15	24	110	"	H.R. Braced
AFT SIDE HOUSES	1	.007	7	.036	15	24	110	"	"
LOWER DECK COMPASS GEAR	1	.007	7	.036	15	24	550	"	"
AFT LAMPS									
HEATERS									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP										
MAIN BILGE LINE PUMPS										
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP										
SANITARY PUMP										
CIRC. SEA WATER PUMPS										
CIRC. FRESH WATER PUMPS										
NO. 1 COAL & OIL ROOM FAN, LOWER COAL & OIL COMPRESSOR	2	1	.01	7	.014	28	31	150	Rubber.	H. R. Braced
MIDDLE COAL	2	1	.0225	7	.064	39	46	40	"	L. C. B.
FRESH WATER PUMP	2	1	.0225	7	.064	39	46	72	"	"
ENGINE TURNING GEAR										
ENGINE REVERSING GEAR										
LUBRICATING OIL PUMPS										
OIL FUEL TRANSFER PUMP										
WINDLASS										
DOMESTIC SERVICE WINDLASS - FORWARD	1	1	.0225	7	.064	40	46	120	"	"
ABRINE PUMP	1	1	.003	3	.036	8	12	120	"	"
WINCHES, AFT										
CIRCULATING WATER PUMP	1	1	.003	3	.036	8	12	150	"	"
STEERING GEAR—										
(a) MOTOR GENERATOR										
(b) MAIN MOTOR										
WORKSHOP MOTOR	1	1	.0045	7	.029	13	18.2	180	"	"
VENTILATING FANS ENG. RM.	2	1	.007	7	.036	16	24	135	"	"
" TUNNEL	1	1	.003	3	.036	6	12	250	"	"
NO. 2 COAL & OIL FAN, UPPER COAL	2	1	.01	7	.044	24	31	450	"	H.R. Braced in Tubing
" MIDDLE "	2	1	.0225	7	.064	39	46	460	"	"
" LOWER "	2	1	.04	19	.052	47	64	470	"	"
NO. 3 " " " UPPER COAL	2	1	.0045	7	.029	15	18.2	370	"	"
" MIDDLE "	2	1	.01	7	.044	24	31	380	"	"
" LOWER "	2	1	.01	7	.044	28	31	390	"	"

All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.

The foregoing is a correct description.

CAMPBELL & ISHAKWOOD, LTD.

J. Campbell

Electrical Engineers.

Date 3. 11. 36

COMPASSES.

Distance between electric generators or motors and standard compass 60 feet

Distance between electric generators or motors and steering compass 60 feet

The nearest cables to the compasses are as follows:—

A cable carrying .18 Ampères led into feet from standard compass 10 feet from steering compass.

A cable carrying .14 Ampères 10 feet from standard compass led into feet from steering compass.

A cable carrying 10 Ampères 12 feet from standard compass 8 feet from steering compass.

Have the compasses been adjusted with and without the electric installation at work at full power Yes

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted Yes

The maximum deviation due to electric currents was found to be nil degrees on any course in the case of the standard

compass, and nil degrees on any course in the case of the steering compass.

THE GREENOCK DOCKYARD CO., LTD.

W. Macanay

Builder's Signature.

Date 5. 11. 36

Is this installation a duplicate of a previous case Yes If so, state name of vessel T.S.S. "PERTSHIRE"

General Remarks (State quality of workmanship, opinions as to class, &c.) The electrical equipment of this

vessel has been fitted on board under special survey, tested under full working conditions and found satisfactory. The materials and workmanship are good.

J. G. 9/11/36.

Total Capacity of Generators 290 Kilowatts.

The amount of Fee ... £ 47: - : When applied for at G.R.

Travelling Expenses (if any) £ : 15/6 : When received 11. 11. 36

Committee's Minute GLASGOW 10 NOV 1936

Assigned SEE ACCOMPANYING MACHINERY REPORT.

A. G. Gaffney
Surveyor to Lloyd's Register of Shipping.

2m.584.—Transfer. The Surveys are requested not to write on or below the space for Committee's Minute.

